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09/397,287	09/16/1999	NOBUO FUJITA	103801	8567

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OLIFF & BERRIDGE, PLC  
P.O. BOX 19928  
ALEXANDRIA, VA 22320

EXAMINER

WACHTEL, ALEXIS A

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 03/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Applicant N .

09/397,287

Applicant(s)

FUJITA ET AL.

Examiner

Alexis Wachtel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-17, 19-22 is/are rejected.
- 7) ☒ Claim(s) 5 and 18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

***Detailed Action***

***Election Restriction***

1. The Restriction Requirement filed on 6-5-2003 has been withdrawn and all claims have been examined on the merits.

***Claim Objection***

2. Claims 5 and 18 are objected to for depending on a rejected claim. Claims 5 and 18 would be allowable is rewritten in independent form.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4,6-13,14-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,678,410 to Fujita et al.

With respects to claims 1-4,6-13, the controller device disclosed by Fujita et al is inherently capable of controlling the operations of all fluid flow mechanisms in the disclosed apparatus. Fujita et al discloses:

Per claim 1: a hydrogen absorbing tank containing a hydrogen absorbing material (110) that allows hydrogen gas to move into the hydrogen absorbing tank from an outside thereof and to move out of the hydrogen absorbing tank;

a gas compressor (112) disposed between the hydrogen absorbing tank and a

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hydrogen gas consumer device (111), the gas compressor compressing the hydrogen gas output from the hydrogen absorbing tank at least to a predetermined reference pressure of the hydrogen gas consumer device;

a bypass (114) that opens only when a hydrogen gas generating pressure of the hydrogen absorbing tank is higher than the predetermined reference pressure of the hydrogen gas consumer device; the bypass connected to between the hydrogen absorbing tank and the hydrogen gas consumer device (111) in parallel to the gas compressor; and a controller (140) that operates the gas compressor to compress hydrogen gas output from the hydrogen absorbing tank at least to the predetermined reference pressure when the hydrogen absorbing has a low temperature and the hydrogen gas generating pressure of the hydrogen absorbing tank is believed to be lower than the predetermined reference pressure.

Per claim 2: wherein the hydrogen absorbing tank apparatus has a temperature sensor (Col 8, lines 47-52); and the controller determines whether the hydrogen gas generating pressure is lower than the predetermined reference pressure based on a temperature detected by the temperature sensor.

Per claim 3: wherein the hydrogen absorbing tank has a pressure sensor (Col 8, lines 47-52); and the controller determines whether the hydrogen gas generating pressure is lower than the predetermined reference pressure based on a pressure detected by the pressure sensor.

Per claim 4: wherein the hydrogen gas consumer device includes a fuel cell (111) from which heat is supplied to the hydrogen absorbing tank (Col 8, lines 3-6, lines 28-

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31); and the controller operates the gas compressor during an initial period of operation of the fuel cell.

Per claim 6: wherein the controller (140) operates the gas compressor when an amount of hydrogen stored in the hydrogen absorbing tank has decreased and the hydrogen gas generating pressure of the hydrogen absorbing tank has decreased.

Per claim 7: further comprising a hydrogen gas generator (Col 7, lines 17-20) that supplies hydrogen gas to the hydrogen absorbing tank; wherein when a hydrogen gas generating pressure of the hydrogen gas generator is lower than a predetermined pressure, the controller increases, by using the gas compressor, a pressure of hydrogen gas supplied from the hydrogen gas generator to the hydrogen absorbing tank.

(Examiner notes that with a plurality of gas storage tanks hooked up in series, at least one gas storage tank upstream from at least another gas storage tank is considered a hydrogen gas generator).

Per claim 8: a hydrogen gas generator (Col 7, lines 17-20) that supplies hydrogen gas to the hydrogen gas consumer device; wherein when a hydrogen gas generating pressure of the hydrogen gas generator is lower than the reference pressure of the hydrogen gas consumer device, the controller increases, by using the gas compressor, a pressure of hydrogen gas supplied from the hydrogen gas generator to the hydrogen consumer device. (Examiner notes that with a plurality of gas storage tanks hooked up in series, at least one gas storage tank upstream from at least another gas storage tank is considered a hydrogen gas generator).

Per claim 9: wherein the bypass includes a bypass passage (114) that bypasses

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the gas compressor, and a valve (115) provided in the bypass passage, the valve being openable at a predetermined pressure.

Per claim 10: a hydrogen absorbing tank containing a hydrogen absorbing material (110), a hydrogen inlet and a hydrogen outlet (Col 7, lines 40-45); a gas compressor (112) in communication with the hydrogen outlet of the hydrogen absorbing tank, the gas compressor compressing the hydrogen gas output from the hydrogen absorbing tank at least to a predetermined reference pressure;

a bypass (114) in communication with the hydrogen outlet of the hydrogen absorbing tank, the bypass opening only when a hydrogen gas generating pressure of the hydrogen is higher than the predetermined reference pressure, the bypass defining a flow path in parallel to a flow path defined by the gas compressor; and a controller (140) that operates the gas compressor to compress hydrogen gas output from the hydrogen absorbing tank at least to the predetermined reference pressure when the hydrogen absorbing tank has a low temperature and the hydrogen gas generating pressure of the hydrogen absorbing tank has a low temperature and the hydrogen gas generating pressure of the hydrogen absorbing tank is believed to be lower than the predetermined reference pressure.

Per claim 11: wherein the hydrogen absorbing tank has a temperature sensor (Col 8, lines 47-52); and the controller (140) determines whether the hydrogen gas generating pressure is lower than the predetermined reference pressure based on a temperature detected by the temperature sensor.

Per claim 12: wherein the hydrogen absorbing tank has a pressure sensor (Col

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8, lines 47-52); and the controller (140) determines whether the hydrogen gas generating pressure is lower than the predetermined reference pressure based on a pressure detected by the temperature sensor.

Per claim 13: wherein the bypass includes a bypass passage (114) that bypasses the gas compressor, and a valve (115) provided in the bypass passage, the valve being openable at a predetermined pressure.

Per claim 14: Storing hydrogen gas in a hydrogen absorbing tank containing a hydrogen absorbing material (110) that allows the hydrogen gas to move into the hydrogen absorbing tank and a hydrogen gas compressor device (112) to compress the hydrogen gas output from the hydrogen absorbing tank at least to a predetermined reference pressure of the hydrogen gas consumer device; using a bypass (114) connected between the hydrogen absorbing tank and hydrogen gas consumer device (111) in parallel to the gas compressor to convey the hydrogen gas from the hydrogen absorbing tank to the hydrogen gas consumer device. Examiner notes that the bypass is capable of opening only when a hydrogen gas generating pressure of the hydrogen absorbing tank is higher than the predetermined reference pressure.

Per claim 15: Controller (140) is capable of detecting a temperature of the hydrogen absorbing tank; and controlling the gas compressor by determining whether the hydrogen gas generating pressure is lower than the predetermined reference pressure based on the detected temperature.

Per claim 16: Controller (140) is capable of detecting a pressure of the hydrogen absorbing tank; and controlling the gas compressor by determining whether the

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hydrogen gas generating pressure is lower than the predetermined reference pressure based on the detected pressure.

Per claim 17: wherein the hydrogen gas consumer device includes a fuel cell from which heat is supplied to the hydrogen absorbing tank. Controller (140) is capable of operating the gas compressor during an initial period of operation of the fuel cell.

Per claim 19: Controller (140) is capable of operating the gas compressor when an amount of hydrogen stored in the hydrogen absorbing tank has decreased and the hydrogen gas generating pressure of the hydrogen absorbing tank has decreased.

Per claim 20: Controller (140) is capable of increasing by, using the gas compressor, a pressure of hydrogen gas supplied from the hydrogen gas generator to the hydrogen absorbing tank.

Per claim 21: Controller (140) is capable of increasing, by using the gas compressor, a pressure of hydrogen gas supplied from the hydrogen gas generator to the hydrogen gas consumer device.

Per claim 22: Wherein the bypass includes a bypass that bypasses the gas compressor (Fig.3), and a valve (115) provided in the bypass passage, the valve is opened at a predetermined pressure. Examiner notes that the valve is capable of being opened at a predetermined pressure.

***Allowable Subject Matter***

5. Claims 5 and 18 would be allowable if rewritten to overcome the objections to said claims. Fujita et al does not disclose that the gas compressor is connected to at least one of the fuel cell and the hydrogen absorbing tank by a heating medium



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circulating passage in which a heating medium circulates. In particular, Fujita et al fails to disclose the desirability of modifying the apparatus disclosed by Fujita et al to read on the claim language of claims 5 and 18.

### ***Conclusion***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex Wachtel whose telephone number is 571-272-1455. The examiner can normally be reached on 10:30am to 6:30pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Glenn Caldarola, can be reached at (571)-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Glenn Caldarola  
Supervisory Patent Examiner  
Technology Center 1700